

WHAT IS CLAIMED IS:

- 1 1. A fibrous composition, said fibrous composition comprising:
2 a fiber; and
3 a peroxycarboxylic acid functional group covalently attached to said fiber.
- 1 2. The fibrous composition according to claim 1, wherein said fiber is
2 a member selected from the group consisting of a natural material and a material derived
3 from natural material.
- 1 3. The fibrous composition according to claim 2, wherein said natural
2 material comprises a member selected from the group consisting of cellulose, starch,
3 chitosan, chitin, wool, and silk.
- 1 4. The fibrous composition according to claim 3, wherein said
2 cellulose is a member selected from the group consisting of cotton, rayon, tencel, flax,
3 hemp, and blends of the fibers with polyester and nylon.
- 1 5. The fibrous composition according to claim 1, wherein said fiber
2 comprises polyvinyl alcohol.
- 1 6. The fibrous composition according to claim 1, wherein said
2 peroxycarboxylic acid functional group is derived from an organic acid having at least
3 two carboxyl groups.
- 1 7. The fibrous composition according to claim 1, wherein said
2 peroxycarboxylic acid functional group is derived from a monocarboxylic acid.
- 1 8. The fibrous composition according to claim 6, wherein said organic
2 acid is a member selected from the group consisting of a tetracarboxylic acid, a
3 tricarboxylic acid and a dicarboxylic acid.
- 1 9. The fibrous composition according to claim 1, wherein said fiber
2 has a plurality of peroxycarboxylic acid functional groups.

1 **10.** The fibrous composition according to claim **1**, wherein said organic
2 acid is a member selected from the group consisting of butane tetraacetic acid, citric acid
3 and maleic acid.

1 **11.** The fibrous composition according to claim **10**, wherein said fiber
2 has at least two free carboxylic acid functions.

1 **12.** The fibrous composition according to claim **1**, wherein said
2 peroxycarboxylic acid functional group is a plurality of peroxycarboxylic acid functional
3 groups.

1 **13.** A process for preparing an antimicrobial fiber, said process
2 comprising:

3 (b) immersing a fiber in an aqueous treating solution comprising an
4 organic acid; and

5 (b) treating said fiber with an oxidizing agent to produce a
6 peroxycarboxylic acid function, thereby preparing an antimicrobial fiber.

1 **14.** The process according to claim **13**, wherein said organic acid has at
2 least two carboxyl groups.

1 **15.** The process according to claim **13**, wherein said treating solution
2 further comprises a catalyst.

1 **16.** The process according to claim **15**, wherein said catalyst is selected
2 from the group consisting of an acid catalyst and a basic catalyst.

1 **17.** The process according to claim **15**, wherein said acid catalyst is a
2 member selected from the group consisting of sulfuric acid, methanesulfonic acid and
3 sulfonic acid.

1 **18.** The process according to claim **15**, wherein said catalyst is an ion-
2 exchange resin.

1 **19.** The process according to claim **15**, wherein said catalyst is a
2 member selected from the group consisting of sodium hydroxide and potassium
3 hydroxide.

- 1 **20.** The process according to claim 13, wherein said organic acid is a
2 member selected from the group consisting of butane tetraacetic acid and citric acid.
- 1 **21.** The process according to claim 13, further comprising:
2 removing the excess treating solution from said fiber prior to treating said
3 fiber with an oxidizing agent.
- 1 **22.** The process according to claim 13, wherein said oxidizing agent is
2 an aqueous solution of hydrogen peroxide.
- 1 **23.** The process according to claim 22, wherein said hydrogen peroxide
2 is about 0.5% to about 30% by weight.
- 1 **24.** The process according to claim 13, wherein said oxidizing agent is
2 an oxygen bleach.
- 1 **25.** The process according to claim 24, wherein said oxygen bleach is a
2 member selected from the group consisting of hydrogen peroxide and sodium perborate.
- 1 **26.** The process according to claim 13, wherein said fiber is an article.
- 1 **27.** The process according to claim 26, wherein said article is a
2 member selected from the group consisting of a surgeon's gown, a cap, a mask, a surgical
3 cover, a patient drape, a carpeting, a bedding material, an underwear, a sock, a bandage, a
4 pad, a sheet, and a uniform.
- 1 **28.** The process according to claim 13, wherein said fiber is cellulosic
2 material.
- 1 **29.** The process according to claim 28, wherein said cellulosic material
2 is a member selected from the group consisting of cotton, rayon, tencel, flax, hemp, and
3 blends of the fibers with polyester or nylon.
- 1 **30.** The process according to claim 13, wherein said fiber is selected
2 from the group consisting of chitosan and chitin material.
- 1 **31.** The process according to claim 13, wherein said antimicrobial
2 activity is regenerable.